

## CLAIMS

### WHAT IS CLAIMED IS:

1. A system for transferring data over a remote direct memory access (RDMA) network, comprising:
  - a host comprising a driver and a network interface card (NIC), the driver being coupled to the NIC,
    - wherein the driver and the NIC perform a one-shot initiation process of an RDMA operation.
2. The system according to claim 1, wherein the driver posts a single command message to perform the one-shot initiation process.
3. The system according to claim 2, wherein the single command message comprises a command to describe pinned-down memory buffers of the host.
4. The system according to claim 3, wherein the single command message further comprises a command to bind a portion of the pinned-down memory buffers of the host to a steering tag (STag).
5. The system according to claim 4, wherein the single command message further comprises a command to write a send command.
6. The system according to claim 4, wherein the NIC places the STag value in an optional field in a direct data placement DDP or RDMA header.
7. The system according to claim 6, wherein the NIC encodes a value into a field in the DDP or RDMA header indicating that the STag value in the optional field is valid.

8. The system according to claim 6, wherein the NIC sets one or more bits in a field in the DDP or RDMA header indicating that the STag value in the optional field is valid.

9. The system according to claim 6, wherein the NIC sets one or more bits or encodes a value into a second field in the DDP or RDMA header to advertise the portion of the pinned memory buffers of the host associated with the STag.

10. The system according to claim 2, wherein the single command message provides a description of a section of memory.

11. The system according to claim 2, wherein the single command message is posted to a command ring of the host.

12. The system according to claim 11, wherein the driver allocates an STag value.

13. The system according to claim 12, wherein the STag value is returned synchronously from a command call.

14. The system according to claim 12, wherein the STag value is saved in a driver command table of the host.

15. The system according to claim 14, wherein the STag value saved in a driver command table is associated with an application reference number.

16. The system according to claim 1, wherein the NIC comprises an RDMA-enabled NIC.

17. A system for transferring data over a remote direct memory access (RDMA) network, comprising:

a host comprising a driver and a network interface card (NIC), the driver being coupled to the NIC,

wherein the driver and the NIC perform a one-shot completion process of an RDMA operation.

18. The system according to claim 17, wherein the NIC receives a message comprising an optional field carrying a STag value, the STag value being associated with pinned memory in a remote host.

19. The system according to claim 18, wherein a header of the message indicates the validity of the optional field with a bit flag or specified value in an encoded field.

20. The system according to claim 18, wherein the NIC de-associates the STag value with the pinned memory in the host, thereby preventing further access to the pinned memory using the de-associated STag value.

21. The system according to claim 18,  
wherein the NIC delivers the message to the driver, and  
wherein the driver compares the STag value received with a STag value previously sent.

22. The system according to claim 18, wherein the NIC de-associates the STag value with previously associated SGL information.

23. The system according to claim 20, wherein the NIC frees any resources dedicated to information regarding the pinned memory.

24. A method for transferring data over an RDMA network, comprising:
  - initiating an RDMA write operation using a one-shot initiation process between a driver and a NIC;
  - inserting an STag value in a first field of a DDP or RDMA header of an RDMA send message; and
  - validating the STag value in the first field with a bit flag or other specified value in a second field of the DDP or RDMA header.
  
25. A method for transferring data over an RDMA network, comprising:
  - completing an RDMA write operation using a one-shot completion process between a NIC and a driver of a host;
  - receiving a completion message;
  - identifying a STag value in a first field of a header of the completion message; and
  - validating the STag value in the first field of the header by identifying a bit flag or other specified value in a second field of the header.